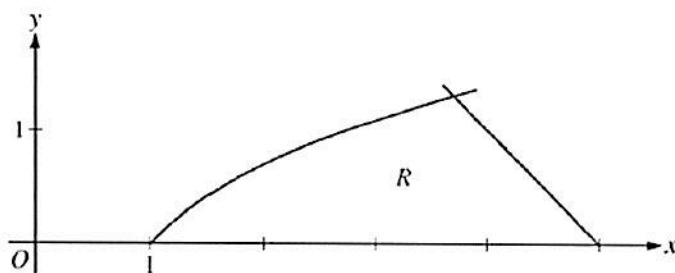
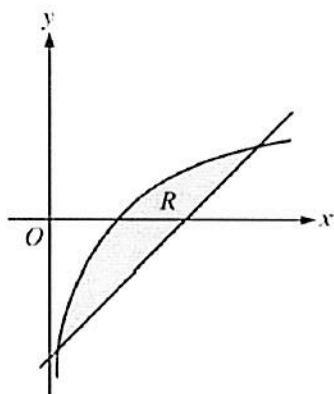


1. Let  $R$  be the region enclosed by the graph of  $y = \frac{x^2}{x^2 + 1}$ , the line  $x = 1$ , and the  $x$ -axis. Find the area of  $R$ .

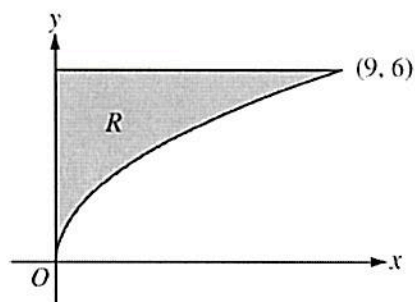


2. Let  $R$  be the region in the first quadrant bounded by the  $x$ -axis and the graphs of  $y = \ln x$  and  $y = 5 - x$ , as shown in the figure above. Find the area of  $R$ .



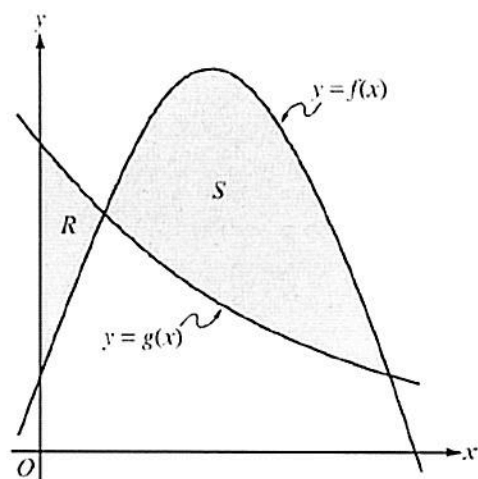
3. Let  $R$  be the shaded region bounded by the graph of  $y = \ln x$  and the line  $y = x - 2$ , as shown above. Find the area of  $R$ .

4. Let  $R$  be the region in the first and second quadrants bounded above by the graph of  $y = \frac{20}{1+x^2}$  and below by the horizontal line  $y = 2$ . Find the area of  $R$ .



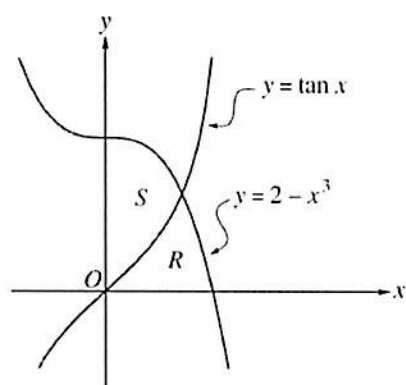
5. Let  $R$  be the region in the first quadrant bounded by the graph of  $y = 2\sqrt{x}$ , the horizontal line  $y = 6$ , and the  $y$ -axis, as shown in the figure above.

Find the area of  $R$ .



6. Let  $f$  and  $g$  be the functions given by  $f(x) = \frac{1}{4} + \sin(\pi x)$  and  $g(x) = 4^{-x}$ . Let  $R$  be the shaded region in the first quadrant enclosed by the y-axis and the graphs of  $f$  and  $g$ , and let  $S$  be the shaded region in the first quadrant enclosed by the graphs of  $f$  and  $g$ , as shown in the figure above.

- (a) Find the area of  $R$ .
- (b) Find the area of  $S$ .



7. Let  $R$  and  $S$  be the regions in the first quadrant shown in the figure above. The region  $R$  is bounded by the  $x$ -axis and the graphs of  $y = 2 - x^3$  and  $y = \tan x$ . The region  $S$  is bounded by the  $y$ -axis and the graphs of  $y = 2 - x^3$  and  $y = \tan x$ .
- (a) Find the area of  $R$ .
- (b) Find the area of  $S$ .